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THE SAND-HILL CRANE.

BY HON. J. D. CATON.

SOME observations which I have made of the habits of the sand-hill crane (*Grus americana*) in domestication in my acclimatation grounds, may be interesting, as I am not aware that this interesting bird has been much studied under such conditions.

Seven years ago Father Terry, the Catholic priest in Ottawa, Illinois, presented me with two sand-hill cranes, then three years old. They had run about his house and yards, and in the street of the city near by. They manifested a strong appreciation of the kindness he had shown to them, and whenever he returned home, whether in the day or the night time, they manifested their satisfaction by their loud calls and uncouth gestures. If in the street they were pursued by a dog, they took wing and flew home with the ease and facility of the wild bird, and yet they showed no disposition to leave and revert to the wild state, even at the migratory season of the species.

In my grounds they necessarily received less personal attention and gradually became less attached to man, but could often be induced to dance and play with me in their awkward but very amusing way. They are inclined to be imitative. Forty years ago, when they were very abundant in this country, a farmer whom I well knew, assured me that he had one in domestication which when a year old would fly on to the hay stack and tramp around in imitation of the boy, and would also take the lines in its beak and follow the horses, breaking prairie, for a considerable time, with a stately strut that was very amusing.

For the first year or two in my grounds they were inclined to associate together, but gradually become estranged and avoided each other's society. Indeed for years they avoided each other, and were never seen together. One season one of these birds got into the north park and attached itself to the pigs, which it followed about constantly, and when it returned to the south park seemed quite disconsolate, and kept near the dividing fence where it could see its friends on the other side, and if they came near would greet them with its loud harsh note, which could be heard half a mile away. Several times during the summer she managed to join her unnatural associates and followed them with

a constant devotion ; this is the only instance in which I have seen one of these birds attach itself to any other animal in the grounds.

I have never observed these birds to eat grass. When they were abundant here in the wild state, they were considered very destructive to the winter wheat after it had sprung up and attained a considerable growth in the fall. I have seen hundreds together on a wheat field in November, but I was so careless an observer then that I cannot tell whether they took the blades of the plant or the decayed seed or roots. The only food I have observed them to take in my grounds was maize and insects.

There are two ponds of water in the grounds, in which there are small frogs, but I have never seen them step into the water or hang about them as if hunting for food. Others seem to have proved that in the wild state they habitually feast on frogs and small snakes, but if they do this in domestication it has escaped my observation.

When these birds were eight years old, that is two years ago last spring, both laid eggs—two each—both eggs were laid on the bare ground without the least attempt to make a nest, and neither attempted to set upon the eggs, though one of them stood about them for a few days as if to guard them, and made a great outcry if any one came near. The next year (1879) they again laid two eggs each, on the naked ground as before, without any nest. This time one sat upon her eggs with apparent devotion for three days, when, as if appreciating that it was labor lost, she left them without further attention.

Last summer, through the kindness of Dr. Row, of the Chicago *Field*, I obtained a male bird, one year old, as I understood, and placed him in the grounds with the others. He was not quite as large as the adult females. He manifested no disposition to associate with either of them. All three wandered about the grounds separately, though the females when they chanced to meet the youngster treated him as though they regarded him as an intruder.

In October last one of the females was killed by a mink who ate off the head and part of the neck, leaving the body untouched. (The same rascal no doubt killed a pair of Hawaiian gēese which I valued above price.) I had it cooked, and though nine years old found it tender and of excellent flavor.

During the winter the remaining pair of cranes were forced into a closer companionship, as they remained about the premises where all the fowls were fed with Indian corn. Early in the spring they manifested their natural instinct by a closer intimacy, and soon became inseparable.

On my return home about the first of June I found the female setting on four eggs in a nest consisting of a slight depression on the border of a bunch of leaves which had been arrested by a pile of brush. The nest was not protected by the brush but quite outside of it. The keeper informed me that she had been thus faithfully employed for four weeks, and I hoped soon to see the young birds and determine the period of incubation. She sat upon that nest with great constancy for four weeks longer, when I ordered the eggs to be removed.

The habit of the cock during this time was quite interesting. He spent most of his time pretty near the nest, and guarded it with great fidelity and defended it with courage. If a cow or a deer came near it he flew at it in a rage, and a few thrusts with his sharp beak sent it away in a hurry, and if he saw a buggy coming in that direction, he raised his coarse harsh voice in so threatening a way as not to be mistaken, and if it came too near he flew at it, attacking either the buggy or the horse, whichever he happened to be nearest, and if it went within say fifteen or twenty feet of the nest, the female would leave the eggs and join in the attack, and the premises were soon cleared. Indeed, my friends who are in the habit of visiting my grounds soon learned to give that family domain a wide berth. In fact he was almost as constant in his watchfulness, and as pugnacious in his conduct as a wild (Canada) gander whose goose was sitting across the ravine.

It was the habit of this cock whenever the hen left the nest to seek for food, to take her place, and do the best he could, but he cut an awkward figure sitting on the nest, for his long legs seemed to be much in his way, while the female had managed to assume rather a graceful position while performing that maternal duty. The eggs probably were not in fact fertilized. I hope to be more fortunate next season, and raise a brood of young sand-hill cranes.

The male is now fully one-third larger than the female, though he is but two years old. Since the nest was broken up both are

constantly together, rarely being seen twenty feet apart. He is as gallant in the defence of his mate as ever. But the other day I picked up the female to examine more closely the red portion of the head when a vigorous thrust of his sharp beak as he flew at me admonished me that he thought I was taking unwarrantable liberties, and the attack was followed up with great vigor till I got the whip and tickled him smartly about the head, when he retreated in tolerable order. In the mean time the female had got quite a way off, which no doubt he thought a good excuse for the discontinuance of the attack.

A word about the color of these birds. One of the females when they came into my grounds had two white feathers on the back, which have proved constant ever since. All the others are of the regulation blue of the species. I think Audubon would have admitted that a ten year old bird was no longer young, and would have despaired of ever seeing it turn into a white *Grus canadensis*.

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ON THE MICROSCOPIC CRYSTALS CONTAINED IN PLANTS.

BY W. K. HIGLEY.

[*Concluded from October number.*]

I shall now take up the species of the family Vitaceæ and in these a wider view of crystals will be presented.

This family gives us a good field for the examination of both raphides and sphæraphides in the same plants. In all the species that I have examined the raphides were the most abundant in the leaves with their appendages, the petiole, and the epidermis of the stem in young plants, while the sphæraphides were more common in the old stems and berry, but were also found, though rarely, in the other parts mentioned for raphides. Crystals in the grape have been known for a long time. In the common cultivated grape, raphides are abundant, but the largest are only found in the leaf and petiole, and at times much smaller ones may be looked after in the fruit. These crystals, whenever found, gave the test for phosphoric acid and lime. In the pulp of the berry sphæraphides are abundant; those of the fruit stalks were about